

REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 132-150 are pending in this application. Claim 132 is independent. The remaining claims depend, directly or indirectly, from claim 132.

Claim Amendments

Claim 132 has been amended to more clearly define the “redundant cutting arrangement.” The language of claim 132 has been taken from paragraph [0047]. No new matter has been added by way of these amendments as they are fully supported by the specification.

Rejection(s) under 35 U.S.C § 103

REJECTIONS OF CLAIMS 132-135, 139, 140, 143, 145, 146, AND 148-150:

Claims 132-135, 139, 140, 143, 145, 146, and 148-150 were rejected under 35 U.S.C. § 103 as being obvious over U.S. Patent No. 5,853,054 (“McGarian”) in view of U.S. Patent No. 5,607,025 (“Mensa-Wilmot ‘025”). Claim 132 has been amended to clarify the present invention. To the extent that this rejection may still apply to the amended claims, the rejection is respectfully traversed.

The amended independent claim 132 recites an expandable reaming tool that includes at least two reamer pads, at least one blade formed on each of the at least two reamer pads, and a plurality of cutting elements disposed on the blades. The at least two reamer pads are operatively coupled to a tool body and adapted to be displaced between a retracted and an expanded position. Further, selected ones of the plurality of cutting elements disposed on one of the at least two reamer pads are positioned at a substantially same axial location as other selected ones of the plurality of cutting elements so as to form a redundant cutting arrangement.

The Examiner asserts that McGarian discloses the invention of claim 132 except for the “redundant” cutters. The Examiner further asserts that Figs. 1, 2, and 5-9 illustrate some redundant cutting. The Applicant respectfully disagrees with this characterization of the prior art reference. In fact, McGarian specifically discusses the actual cutting element arrangement on the blades.

In McGarian, the cutting elements “are suitably spaced and offset to give full area coverage as the tool rotates (Column 6, line 62).” As is known in the art, full area coverage is generally accomplished by a slight overlap (redundancy) of the cutting elements from one blade to the next as the tool is rotated. This ensures that the whole is fully cut. In contrast to the claimed invention, McGarian simply fails to disclose or suggest arranging the cutting elements to provide for redundant cutting as accomplished by having cutting elements disposed “to contact a wellbore at a substantially same axial location.”

Mensa-Wilmot ‘025 discloses a cutting structure for a drill bit. The cutting structure includes cutting elements that are *radially* spaced so as to form a partially

redundant cutting structure (column 8, lines 9-13). An illustration of this cutting element arrangement is illustrated in Figure 4 of Mensa-Wilmot '025. The partial overlap serves the purpose of forming "stability enhancing ridges of formation material," which would reduce vibration (column 8, lines 14-34).

Substantial overlapping of cutter elements from one blade to the next (as recited in the claims of the present application) and partial overlapping are not equivalent. Any partial overlapping of the successive cutter elements does not provide the same cutting result as the claimed axial overlapping.

In the present invention, there is a substantial redundancy of the cutting action performed by the underreamer. Partial overlapping of the cutter elements as taught by Mensa-Wilmot '025 is intended to create stability enhancing ridges in the formation, which reduces vibration to increase the drill bit life. These are not equivalent, nor does Mensa-Wilmot '025 suggest making a change to achieve the claimed invention.

Moreover, it is known in the art that successful cutter element arrangements for drill bits may not be successful for underreamers, and vice versa. This is due to the different roles of drill bits and underreamers. Drill bits must create a hole, while underreamers expand a previously drilled hole. In general, when designing drill bits or underreamers, one of ordinary skill in the art would not look to the teachings of one of these art areas in order to solve a problem in the other. Thus, one of ordinary skill in the art would not be motivated to combine the disclosure of McGarian with the disclosure of Mensa-Wilmot to achieve the claimed invention. Furthermore, even if the references were properly combinable, the references fail to disclose all of the features as required by the amended claims.

As further evidence of the distinctions between the prior art and the present claims, the Applicant submits an affidavit, pursuant to 37 C.F.R. §1.132, which further explains the differences.

In view of the above, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in the claim 132. Thus, the claims are patentable over McGarian and Mensa-Wilmot '025. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 136 AND 147:

Claims 136 and 147 were rejected under 35 U.S.C. § 103 as obvious over McGarian in view of Mensa-Wilmot '025 as applied to claim 132 above, and further in view of either U.S. Patent No. 5,979,576 ("Hansen") or U.S. Patent No. 6,142,250 ("Griffin"). This rejection is respectfully traversed.

As described above with respect to claim 132, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in amended claim 132. Further, neither Hansen nor Griffin shows or suggests that which is not provided in McGarian and Mensa-Wilmot '025. Hansen and Griffin teach how to reduce bit whirl by decreasing vibration. At no point do they teach to reduce vibration by employing vibration damping inserts as in claim 136. At no point do they disclose or suggest the cutting element structure as presented in claim 147. Further, Hansen and Griffin do not suggest a redundant cutting arrangement as provided in amended claim 132.

In view of the above, McGarian, Mensa-Wilmot '025, Hansen, and Griffin fail to show or suggest the present invention as recited in the claim 132. Thus, claims 136 and

147, which are dependent from claim 132, are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 137, 138, AND 144:

Claims 137, 138, and 144 were rejected under 35 U.S.C. § 103 as obvious over McGarian in view of Mensa-Wilmot '025 as applied to claim 132 above, and further in view of either U.S. Patent No. 6,269,893 ("Beaton") or U.S. Patent No. 6,516,293 ("Huang"). This rejection is respectfully traversed.

As described above with respect to claim 132, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in claim 132. Further, Beaton and Huang, whether considered separately or in combination, fail to provide that which is not shown or suggested in McGarian and Mensa-Wilmot '025. Beaton and Huang do not disclose the redundant cutting structure of amended claim 132.

In view of the above, McGarian, Mensa-Wilmot '025, Beaton, and Huang fail to show or suggest the present invention as recited in the claim 132. Thus, claims 137-138 and 144, which depend from claim 132, are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIMS 141 AND 142:

Claims 141 and 142 were rejected under 35 U.S.C. § 103 as obvious over McGarian in view of Mensa-Wilmot '025 as applied to claim 132 above, and further in view of U.S. Patent No. 6,164,394 ("Mensa-Wilmot '394"). This rejection is respectfully traversed.

As described above with respect to claim 132, McGarian and Mensa-Wilmot '025 fail to show or suggest the present invention as recited in claim 132. Further, Mensa-

Wilmot '394 fails to show or suggest that which is not provided in McGarian and Mensa-Wilmot '025. Mensa-Wilmot '394 does not disclose the redundant cutting element arrangement of claim 132.

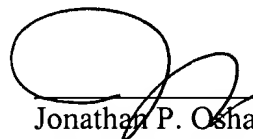
In view of the above, McGarian, Mensa-Wilmot '025, and Mensa-Wilmot '394 fail to show or suggest the present invention as recited in the claim 132. Thus, claims 136 and 147, which are dependent from claim 132, are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

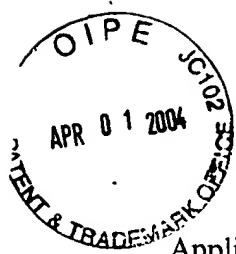
Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 05516.089001).

Respectfully submitted,

Date: 4/6/04


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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Carl HOFFMASTER *et al.*
Serial No.: 09/924,961
Filed : August 8, 2001
Title : ADVANCED EXPANDABLE REAMING TOOL

Art Unit : 3672
Examiner : Dang, Hoang

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GROUP 3600

Assistant Commissioner for Patents
Washington, DC 20231

DECLARATION OF Graham Mensa-Wilmot UNDER 37 CFR § 1.132

I, Graham Mensa-Wilmot, hereby declare that:

1. I received a **Master's Degree in Drilling Engineering** from the **Petroleum Engineering Department** at the **University of Petroleum and Gas** in 1987.
2. I have worked in the field of **Oil Well Drilling and associated disciplines** for 19 years. Since 1988, I have been involved in the **design, development and use** of drill bits – while working in the drilling industry.
4. I am familiar with the above referenced patent application, and have reviewed the Examiner's rejections.
5. I am currently employed by Smith International, Inc..
6. I am not a listed inventor on the present application.
7. As I understand U.S. Patent No. 5,853,054 (“McGarian”), the primary teaching of McGarian is to provide an underreamer with expandable blades. The teachings of McGarian relate to the mechanism that allows the underreamer to have expandable blades. Additionally, McGarian suggests that cutting elements disposed on the expandable blades are spaced to provide full cutting coverage while rotating.

8. As I understand U.S. Patent No. 6,507,025 ("Mensa-Wilmot '025"), the primary teaching of Mensa-Wilmot '025 is to locate PDC cutter elements on a drill bit such that there is a partial overlap of the PDC cutter elements from one blade to the next. More specifically, the sizes of the PDC cutter elements are varied so that smaller PDC cutter elements partially overlap the cutting area of larger PDC cutter elements. Mensa-Wilmot '025 teaches that the partial overlap of the PDC cutter element creates stability enhancing ridges of formation material as the bit is rotated. The increased stability reduces vibration of the bit, and, as a result, increases the life of the drill bit.

9. Cutter elements are typically arranged on a reamer blade such that the cutter elements on the next reamer blade cut a different portion of the formation. This is typically accomplished by gradually changing the position of each successive cutter element from one blade to the next.

10. It is known in the art that successful cutter element arrangements for drill bits may not be successful for underreamers, and vice versa. This is due to the different roles of drill bits and underreamers. Drill bits must create a hole, while underreamers expand a previously drilled hole. In general, when designing drill bits or underreamers, one of ordinary skill in the art would not look to the teachings of one of these art areas in order to solve a problem in the other. Thus, one of ordinary skill in the art would not be motivated to combine the disclosure of McGarian with the disclosure of Mensa-Wilmot to achieve the claimed invention. Furthermore, even if the references were properly combinable, the references fail to disclose all of the features as required by the amended claims.

11. As I understand, a combination of references, namely, McGarian and Mensa-Wilmot '025, must contain all of the elements of a claim or render any additional elements as obvious.

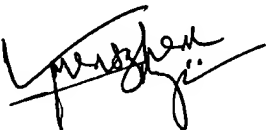
12. As a person of at least ordinary skill in the art, I believe that Mensa-Wilmot '025 does not show or suggest that substantial overlapping, as recited in the present claims, of the cutter elements may be desirable.

13. Substantial overlapping of cutter elements from one blade to the next (as recited in the claims of the present application) and partial overlapping are not equivalent. Any partial overlapping of the successive cutter elements does not provide the same cutting result as the claimed axial overlapping. In the present invention, substantial redundancy of the cutting action performed by the underreamer occurs. Partial overlapping of the cutter elements as taught by Mensa-Wilmot '025 is intended to create stability enhancing ridges in the formation, which reduces vibration to increase the drill bit life.

14. Thus, the combination of McGarian and Mensa-Wilmot '025 does not show or suggest an expandable underreamer with cutting elements arranged on the reamer blades to form a redundant cutting arrangement.

I further declare that all statements made herein of my own knowledge are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,



Date: 4/1/04